REMARKS

The abstract was objected to for being too long. Applicant has amended the abstract to conform to 37 CFR 1.72.

The drawings were objected to as including a reference number (i.e. 2) not mentioned in the description. Applicant has amended the specification to refer to the reference number. Applicant believes the drawings now conform to the requirements of 37 CFR 1.84(p)(5).

Claims 1-3 remain pending in the Application. Claims 4-7 have been newly added. Applicant respectfully requests consideration of the remarks presented herein.

Applicant's invention is directed toward a hexavalent chromium free metal plating treatment process. Hexavalent chromium is commonly used in the metal plating treatment process to provide metallic objects, such as screws and nails, with a black corrosion resistant covering. Hexavalent chromium, however, is a recognized human carcinogen. The use of hexavalent chromium in the metal plating treatment process poses many environmental and safety concerns. Because of these concerns, there is a global movement to restrict the uses of hexavalent chromium.

Many manufacturers have begun using trivalent chromium as a substitute for hexavalent chromium in the plating process. Conventional processes, however, result in plating having a white or bluish off-white coloring. If a black color is desired, a black paint or other coating is applied over the plating.

Applicant's method provides a black chromate plating without the need to use hexavalent chromium. Applicant's black plating process is a desired advance in a relatively crowded field of corrosion treatment and provides a practical benefit.

> "Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light."
>
> *Continental Can Co. USA Inc. v. Monsanto Co.*, 20 U.S.P.Q. 2d. 1746, 1752 (Fed. Cir. 1991).

Claims 1-3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oshima et al* (U.S. Pat. No. 6,719,852), in view of *Duprat* (WO 02/07902) and further in view of *Hartley et al.* (U.S. Pat No. 4,243,434). Applicant respectfully traverses.

Oshima's disclosure is directed toward a thin hexavalent chromium free film, (*Oshima*, Column 2, Lines 34-36). *Oshima's* chromium free film is not black. To color the film, a topcoat or paint containing a dye is applied over the chromium free film, (*Oshima*, Column 6, Lines 23-25, 47-51). *Oshima*, thus fails to disclose or suggest a black chromate plating step.

Duprat's disclosure is directed toward a two layer black anticorrosive coating, (*Duprat*, Page 1, 1st paragraph). The first layer contains 1-4 mg/dm^2 of chromium, (*Duprat*, Page 4, 2nd paragraph). The second layer contains an organic polymer, a metal oxide and a black pigment, (*Duprat*, Page 4, 2nd paragraph). *Duprat's* chromium layer is not black. The black coloring results from the black pigment in the second layer. Duprat thus also fails to disclose or suggest a black chromate plating step.

Hartley's disclosure is directed toward solid lubricants for metalworking tools, (*Hartley*, Column 1, Lines 5-6). The metalworking tools are coated with lubricant to protect and reduce wear on the tool, (Column 1, Lines 14-16). *Hartley* is silent regarding a black chromate plating step.

Claims 1-3 recite:

> [1] forming a black coating on the rinsed coated metal part in an organic salt solution containing trivalent chromium and iron components as main ingredients in a black chromate treatment step (20).
>
> [2] forming a conversion coating on the rerinsed metal part in a solution of inorganic salt and organic acid containing trivalent chromium and silica as main ingredients in a finish treatment step (30).

In the black chromate treatment step a black chromate coating is formed. In the finish treatment step a transparent chromate coating is formed. The transparent chromate coating protects the iron components from oxidizing and forming ferric oxide (red rust). The dual chromate coatings protect the metal from water thereby preventing ferrous oxide (black rust).

The Office Action points out correctly that *Oshima* does not teach the formation of a black coating through the use of iron, (Office Action, Page 4, Lines 3-4).

The Office Action, however, asserts that *Duprat* teaches that iron can be added to a trivalent free chromium coating solution in order to achieve a black color finish, (*Duprat*, Page 4, Lines 5-10). Applicant respectfully traverses.

Duprat does not teach or suggest the addition of iron to form a black chromate coating. *Duprat's* chromate is not black. This is evident because *Duprat* teaches the use of a second layer having black pigment to provide a black color. Specifically, *Duprat* teaches formation of a chromate layer of 1 to 4 mg/dm^2 in a first step and formation of a black layer having a black pigment in a second step (*Duprat*, Page 4, 2nd paragraph). The black pigment provides the black coloring to the black layer formed over the non-black chromate layer (*Duprat*, Page 4, 2nd paragraph, Page 9, 1st paragraph, Page 10).

Applicant's formation of a black chromate is an important feature of the invention. With Applicant's method, there is no need to add pigments, paints, or coatings to achieve a black color. The method provides uniform black plating on a metal object without the need for hexavalent chromium. Thus, both a marketable appearance and an environmentally acceptable product is provided.

Claims 4-7 are newly added and recite an embodiment of the invention previously disclosed but not claimed. Claim 4 recites a method of treating a zinc surface to improve corrosion resistance and to provide black color 10. Claim 4 and the dependent claims define the steps of: activating the zinc surface by immersion in a dilute nitric acid solution 11; rinsing the zinc surface with water 12; treating the zinc surface with an inorganic salt solution having trivalent chromium and iron components forming a black chromate 20; rinsing the zinc surface with water 21; and treating the zinc surface with an inorganic salt and organic acid solution having trivalent chromium iron and silica forming a transparent chromate 30, (Application, Page 8, Line 1, Page 9, Line 23).

Claim 4 also recites treating the zinc surface with an inorganic salt solution having trivalent chromium and iron components forming a black chromate. As explained above, *Oshima, Duprat* and *Hartley* fail to disclose the formation of a black chromate making claim 4 patentable over any combination of these references.

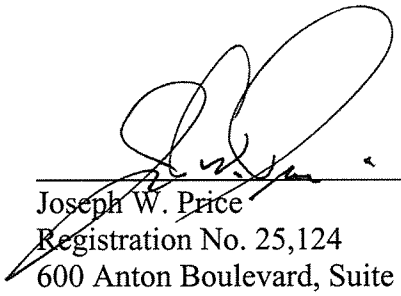
New Claim 7 also defines a method for forming a black chromate surface in an improved manner to provide the advantages of the present invention.

For the reasons stated above, Applicant believes the application is in condition for allowance and early notification of the same is respectfully requested.

If there are any questions with regard to the prosecution of this application, the undersigned attorney can be contacted at the listed phone number.

Very truly yours,

SNELL & WILMER L.L.P.



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